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NORTHERN DELAWARE BASIN

LEA COUNTY, NM

BULLDOG

HENNIN FED #24H

OWB

Design: ACTUAL WELLPATH

Standard Survey Report

05 July, 2018

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #24H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170.7+30 @ 3200.7usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170.7+30 @ 3200.7usft (NABORS 894)
Well:	HENNIN FED #24H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

Project	LEA COUNTY, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	BULLDOG			
Site Position:		Northing:	398,637.10 usft	Latitude: 32° 5' 36.820 N
From:	Map	Easting:	741,887.40 usft	Longitude: 103° 33' 8.116 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.42 °

Well	HENNIN FED #24H			
Well Position	+N-S	0.0 usft	Northing: 393,796.10 usft	Latitude: 32° 4' 43.937 N
	+E-W	0.0 usft	Easting: 803,528.70 usft	Longitude: 103° 21' 12.142 W
Position Uncertainty	3.0 usft	Wellhead Elevation:	usft	Ground Level: 3,170.7 usft

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	WMM2015	2/21/2018	6.79	59.94	47,792.99432211

Design	ACTUAL WELLPATH			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	181.21

Survey Program	Date 7/5/2018			
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.0	11,678.0	GYRO - INTERMEDIATE (OWB)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
11,883.0	17,431.0	MWD-CURVE/LATERAL (OWB)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction

Survey									
Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.80	177.02	100.0	-0.7	0.0	0.7	0.80	0.80	0.00
125.0	0.89	189.13	125.0	-1.1	0.0	1.1	0.80	0.36	48.44
150.0	0.99	179.13	150.0	-1.5	0.0	1.5	0.77	0.40	-40.00
175.0	0.88	175.09	175.0	-1.9	0.0	1.9	0.51	-0.44	-16.16
200.0	0.82	186.56	200.0	-2.2	0.0	2.2	0.72	-0.24	45.88
225.0	1.05	183.40	225.0	-2.7	0.0	2.7	0.94	0.92	-12.64
250.0	0.96	173.84	250.0	-3.1	0.0	3.1	0.76	-0.36	-38.24
275.0	0.91	186.47	275.0	-3.5	0.0	3.5	0.85	-0.20	50.52
300.0	1.00	178.18	300.0	-3.9	0.0	3.9	0.66	0.36	-33.16

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: BULLDOG
Well: HENNIN FED #24H
Wellbore: OWB
Design: ACTUAL WELLPATH

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well HENNIN FED #24H
RKB=3170.7+30 @ 3200.7usft (NABORS 894)
RKB=3170.7+30 @ 3200.7usft (NABORS 894)
Grid
Minimum Curvature
EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
325.0	0.80	177.96	325.0	-4.3	0.0	4.3	0.80	-0.80	-0.88
350.0	0.79	190.88	350.0	-4.6	-0.1	4.6	0.72	-0.04	51.68
375.0	0.71	175.04	375.0	-5.0	-0.1	5.0	0.89	-0.32	-63.36
400.0	0.41	184.12	400.0	-5.2	-0.1	5.2	1.25	-1.20	36.32
425.0	0.47	200.72	425.0	-5.4	-0.1	5.4	0.56	0.24	66.40
450.0	0.43	179.13	450.0	-5.6	-0.1	5.6	0.69	-0.16	-86.36
475.0	0.29	166.83	475.0	-5.7	-0.1	5.7	0.64	-0.56	-49.20
500.0	0.28	196.42	500.0	-5.9	-0.1	5.9	0.58	-0.04	118.36
525.0	0.46	193.42	525.0	-6.0	-0.2	6.0	0.72	0.72	-12.00
550.0	0.38	175.28	550.0	-6.2	-0.2	6.2	0.62	-0.32	-72.56
575.0	0.21	198.76	575.0	-6.3	-0.2	6.3	0.82	-0.68	93.92
600.0	0.37	206.47	600.0	-6.4	-0.2	6.4	0.66	0.64	30.84
625.0	0.44	200.65	625.0	-6.6	-0.3	6.6	0.32	0.28	-23.28
650.0	0.39	185.96	650.0	-6.8	-0.4	6.8	0.47	-0.20	-58.76
675.0	0.33	173.67	675.0	-6.9	-0.4	6.9	0.39	-0.24	-49.16
700.0	0.20	178.56	700.0	-7.1	-0.3	7.1	0.53	-0.52	19.56
725.0	0.16	209.64	725.0	-7.1	-0.4	7.1	0.42	-0.16	124.32
750.0	0.35	264.04	750.0	-7.2	-0.5	7.2	1.15	0.76	217.60
775.0	0.48	255.66	775.0	-7.2	-0.6	7.2	0.57	0.52	-33.52
800.0	0.33	279.02	800.0	-7.2	-0.8	7.2	0.88	-0.60	93.44
825.0	0.46	283.73	825.0	-7.2	-1.0	7.2	0.54	0.52	18.84
850.0	0.54	263.50	850.0	-7.2	-1.2	7.2	0.77	0.32	-80.92
875.0	0.35	267.43	875.0	-7.2	-1.4	7.2	0.77	-0.76	15.72
900.0	0.46	282.66	900.0	-7.2	-1.6	7.2	0.61	0.44	60.92
925.0	0.53	265.51	925.0	-7.2	-1.8	7.2	0.65	0.28	-68.60
950.0	0.46	259.43	949.9	-7.2	-2.0	7.2	0.35	-0.28	-24.32
975.0	0.35	273.91	974.9	-7.2	-2.2	7.2	0.60	-0.44	57.92
1,000.0	0.48	278.25	999.9	-7.2	-2.3	7.2	0.53	0.52	17.36
1,025.0	0.49	256.39	1,024.9	-7.2	-2.5	7.2	0.74	0.04	-87.44
1,050.0	0.36	253.92	1,049.9	-7.2	-2.7	7.3	0.53	-0.52	-9.88
1,075.0	0.24	268.07	1,074.9	-7.3	-2.9	7.3	0.56	-0.48	56.60
1,100.0	0.39	290.64	1,099.9	-7.2	-3.0	7.3	0.77	0.60	90.28
1,125.0	0.35	259.19	1,124.9	-7.2	-3.1	7.3	0.82	-0.16	-125.80
1,150.0	0.23	237.47	1,149.9	-7.2	-3.3	7.3	0.64	-0.48	-86.88
1,175.0	0.12	288.62	1,174.9	-7.3	-3.3	7.3	0.72	-0.44	204.60
1,200.0	0.23	298.57	1,199.9	-7.2	-3.4	7.3	0.45	0.44	39.80
1,225.0	0.27	252.34	1,224.9	-7.2	-3.5	7.3	0.80	0.16	-184.92
1,250.0	0.12	235.13	1,249.9	-7.3	-3.6	7.3	0.64	-0.60	-68.84
1,275.0	0.08	327.94	1,274.9	-7.3	-3.6	7.3	0.59	-0.16	371.24
1,300.0	0.22	316.24	1,299.9	-7.2	-3.6	7.3	0.57	0.56	-46.80
1,325.0	0.22	275.41	1,324.9	-7.2	-3.7	7.3	0.61	0.00	-163.32
1,350.0	0.06	315.41	1,349.9	-7.2	-3.8	7.2	0.71	-0.64	160.00
1,375.0	0.25	356.20	1,374.9	-7.1	-3.8	7.2	0.83	0.76	163.16

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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,400.0	0.25	289.73	1,399.9	-7.0	-3.9	7.1	1.10	0.00	-265.88	
1,425.0	0.11	315.75	1,424.9	-7.0	-3.9	7.1	0.63	-0.56	104.08	
1,450.0	0.26	350.64	1,449.9	-6.9	-3.9	7.0	0.72	0.60	139.56	
1,475.0	0.27	319.52	1,474.9	-6.8	-4.0	6.9	0.57	0.04	-124.48	
1,500.0	0.25	306.68	1,499.9	-6.7	-4.1	6.8	0.25	-0.08	-51.36	
1,525.0	0.14	13.63	1,524.9	-6.7	-4.1	6.8	0.94	-0.44	267.80	
1,550.0	0.34	352.99	1,549.9	-6.6	-4.1	6.7	0.86	0.80	-82.56	
1,575.0	0.38	343.07	1,574.9	-6.4	-4.1	6.5	0.30	0.16	-39.68	
1,600.0	0.27	312.18	1,599.9	-6.3	-4.2	6.4	0.81	-0.44	-123.56	
1,625.0	0.22	310.86	1,624.9	-6.2	-4.3	6.3	0.20	-0.20	-5.28	
1,650.0	0.14	344.18	1,649.9	-6.2	-4.3	6.3	0.51	-0.32	133.28	
1,675.0	0.29	349.04	1,674.9	-6.1	-4.4	6.2	0.60	0.60	19.44	
1,700.0	0.37	354.42	1,699.9	-5.9	-4.4	6.0	0.34	0.32	21.52	
1,725.0	0.40	325.65	1,724.9	-5.8	-4.4	5.9	0.77	0.12	-115.08	
1,750.0	0.25	311.66	1,749.9	-5.7	-4.5	5.8	0.67	-0.60	-55.96	
1,775.0	0.13	347.00	1,774.9	-5.6	-4.6	5.7	0.65	-0.48	141.36	
1,800.0	0.26	13.56	1,799.9	-5.5	-4.6	5.6	0.62	0.52	106.24	
1,825.0	0.32	351.39	1,824.9	-5.4	-4.6	5.5	0.50	0.24	-88.68	
1,850.0	0.27	322.80	1,849.9	-5.3	-4.6	5.4	0.61	-0.20	-114.36	
1,875.0	0.12	354.08	1,874.9	-5.2	-4.6	5.3	0.71	-0.60	125.12	
1,900.0	0.24	42.40	1,899.9	-5.1	-4.6	5.2	0.73	0.48	193.28	
1,925.0	0.44	34.30	1,924.9	-5.0	-4.5	5.1	0.82	0.80	-32.40	
1,950.0	0.37	27.31	1,949.9	-4.9	-4.4	5.0	0.34	-0.28	-27.96	
1,975.0	0.30	46.62	1,974.9	-4.8	-4.3	4.9	0.53	-0.28	77.24	
2,000.0	0.47	65.98	1,999.9	-4.7	-4.2	4.8	0.85	0.68	77.44	
2,025.0	0.59	41.30	2,024.9	-4.5	-4.0	4.6	1.02	0.48	-98.72	
2,050.0	0.42	39.02	2,049.9	-4.4	-3.9	4.5	0.68	-0.68	-9.12	
2,075.0	0.36	59.91	2,074.9	-4.3	-3.8	4.3	0.61	-0.24	83.56	
2,100.0	0.58	67.18	2,099.9	-4.2	-3.6	4.2	0.91	0.88	29.08	
2,125.0	0.65	50.94	2,124.9	-4.0	-3.4	4.1	0.75	0.28	-64.96	
2,150.0	0.55	51.65	2,149.9	-3.9	-3.1	3.9	0.40	-0.40	2.84	
2,175.0	0.50	44.45	2,174.9	-3.7	-3.0	3.8	0.33	-0.20	-28.80	
2,200.0	0.48	50.25	2,199.9	-3.6	-2.8	3.6	0.21	-0.08	23.20	
2,225.0	0.42	54.20	2,224.9	-3.5	-2.7	3.5	0.27	-0.24	15.80	
2,250.0	0.24	13.12	2,249.9	-3.3	-2.6	3.4	1.15	-0.72	-164.32	
2,275.0	0.27	293.79	2,274.9	-3.3	-2.6	3.3	1.31	0.12	-317.32	
2,300.0	0.17	303.85	2,299.9	-3.2	-2.7	3.3	0.43	-0.40	40.24	
2,325.0	0.26	347.49	2,324.9	-3.2	-2.7	3.2	0.72	0.36	174.56	
2,350.0	0.35	336.37	2,349.9	-3.0	-2.8	3.1	0.43	0.36	-44.48	
2,375.0	0.29	316.23	2,374.9	-2.9	-2.9	3.0	0.51	-0.24	-80.56	
2,400.0	0.18	336.51	2,399.9	-2.8	-2.9	2.9	0.55	-0.44	81.12	
2,425.0	0.25	31.61	2,424.9	-2.7	-2.9	2.8	0.83	0.28	220.40	
2,450.0	0.46	34.31	2,449.9	-2.6	-2.8	2.7	0.84	0.84	10.80	

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TVD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
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Database: EDM_Users

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,475.0	0.47	27.27	2,474.9	-2.4	-2.7	2.5	0.23	0.04	-28.16
2,500.0	0.38	35.17	2,499.9	-2.3	-2.6	2.3	0.43	-0.36	31.60
2,525.0	0.47	54.12	2,524.9	-2.2	-2.5	2.2	0.66	0.36	75.80
2,550.0	0.68	52.95	2,549.9	-2.0	-2.3	2.1	0.84	0.84	-4.68
2,575.0	0.73	46.73	2,574.9	-1.8	-2.1	1.9	0.37	0.20	-24.88
2,600.0	0.67	54.25	2,599.9	-1.6	-1.8	1.7	0.44	-0.24	30.08
2,625.0	0.74	65.47	2,624.9	-1.5	-1.6	1.5	0.62	0.28	44.88
2,650.0	0.94	62.17	2,649.9	-1.3	-1.2	1.3	0.82	0.80	-13.20
2,675.0	0.84	54.32	2,674.9	-1.1	-0.9	1.1	0.63	-0.40	-31.40
2,700.0	0.66	51.80	2,699.9	-0.9	-0.6	0.9	0.73	-0.72	-10.08
2,725.0	0.21	47.94	2,724.9	-0.8	-0.5	0.8	1.80	-1.80	-15.44
2,750.0	0.29	45.93	2,749.9	-0.7	-0.4	0.7	0.32	0.32	-8.04
2,775.0	0.27	357.43	2,774.9	-0.6	-0.4	0.6	0.92	-0.08	-194.00
2,800.0	0.18	331.43	2,799.9	-0.5	-0.4	0.5	0.54	-0.36	-104.00
2,825.0	0.07	3.65	2,824.9	-0.5	-0.4	0.5	0.51	-0.44	128.88
2,850.0	0.30	80.00	2,849.9	-0.4	-0.3	0.4	1.17	0.92	305.40
2,875.0	0.36	55.89	2,874.9	-0.4	-0.2	0.4	0.60	0.24	-96.44
2,900.0	0.14	44.29	2,899.9	-0.3	-0.1	0.3	0.90	-0.88	-46.40
2,925.0	0.29	77.96	2,924.9	-0.3	0.0	0.3	0.76	0.60	134.68
2,950.0	0.39	51.44	2,949.9	-0.2	0.1	0.2	0.74	0.40	-106.08
2,975.0	0.23	37.13	2,974.9	-0.1	0.2	0.1	0.71	-0.64	-57.24
3,000.0	0.24	100.41	2,999.9	-0.1	0.3	0.1	0.99	0.04	253.12
3,025.0	0.30	84.41	3,024.9	-0.1	0.4	0.1	0.38	0.24	-64.00
3,050.0	0.13	87.05	3,049.9	-0.1	0.5	0.1	0.68	-0.68	10.56
3,075.0	0.22	142.91	3,074.9	-0.1	0.5	0.1	0.73	0.36	223.44
3,100.0	0.42	112.66	3,099.9	-0.2	0.6	0.2	1.02	0.80	-121.00
3,125.0	0.38	90.19	3,124.9	-0.2	0.8	0.2	0.64	-0.16	-89.88
3,150.0	0.38	123.75	3,149.9	-0.3	1.0	0.3	0.88	0.00	134.24
3,175.0	0.53	116.33	3,174.9	-0.4	1.1	0.3	0.64	0.60	-29.68
3,200.0	0.29	84.67	3,199.9	-0.4	1.3	0.4	1.29	-0.96	-126.64
3,225.0	0.09	144.97	3,224.9	-0.4	1.4	0.4	1.03	-0.80	241.20
3,250.0	0.28	108.64	3,249.9	-0.5	1.4	0.4	0.86	0.76	-145.32
3,275.0	0.19	72.25	3,274.9	-0.5	1.5	0.4	0.68	-0.36	-145.56
3,300.0	0.32	105.25	3,299.9	-0.5	1.6	0.4	0.76	0.52	132.00
3,325.0	0.52	77.15	3,324.9	-0.5	1.8	0.4	1.13	0.80	-112.40
3,350.0	0.42	60.60	3,349.9	-0.4	2.0	0.4	0.67	-0.40	-66.20
3,375.0	0.48	80.17	3,374.9	-0.3	2.2	0.3	0.66	0.24	78.28
3,400.0	0.64	36.73	3,399.9	-0.2	2.4	0.2	1.76	0.64	-173.76
3,425.0	0.47	23.28	3,424.9	0.0	2.5	-0.1	0.85	-0.68	-53.80
3,450.0	0.72	14.45	3,449.9	0.2	2.6	-0.3	1.06	1.00	-35.32
3,475.0	0.90	336.68	3,474.9	0.6	2.6	-0.6	2.21	0.72	-151.08
3,500.0	1.20	318.13	3,499.9	1.0	2.3	-1.0	1.80	1.20	-74.20
3,525.0	1.14	325.05	3,524.9	1.4	2.0	-1.4	0.61	-0.24	27.68
3,550.0	1.28	320.18	3,549.9	1.8	1.7	-1.8	0.69	0.56	-19.48

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: BULLDOG
Well: HENNIN FED #24H
Wellbore: OWB
Design: ACTUAL WELLPATH

Local Co-ordinate Reference: Well HENNIN FED #24H
TVD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
MD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,575.0	1.12	319.53	3,574.9	2.2	1.3	-2.2	0.64	-0.64	-2.60
3,600.0	1.32	320.76	3,599.9	2.6	1.0	-2.6	0.81	0.80	4.92
3,625.0	1.12	323.63	3,624.9	3.0	0.7	-3.0	0.84	-0.80	11.48
3,650.0	1.17	311.75	3,649.9	3.4	0.3	-3.4	0.97	0.20	-47.52
3,675.0	1.13	264.57	3,674.9	3.5	-0.1	-3.5	3.68	-0.16	-188.72
3,700.0	1.26	250.42	3,699.8	3.4	-0.6	-3.4	1.29	0.52	-56.60
3,725.0	1.32	248.78	3,724.8	3.2	-1.1	-3.2	0.28	0.24	-6.56
3,750.0	1.20	246.32	3,749.8	3.0	-1.7	-3.0	0.53	-0.48	-9.84
3,775.0	1.16	256.92	3,774.8	2.8	-2.1	-2.8	0.89	-0.16	42.40
3,800.0	1.33	250.26	3,799.8	2.7	-2.7	-2.6	0.89	0.68	-26.64
3,825.0	1.17	247.05	3,824.8	2.5	-3.2	-2.4	0.70	-0.64	-12.84
3,850.0	1.33	253.73	3,849.8	2.3	-3.7	-2.2	0.86	0.64	26.72
3,875.0	1.25	244.84	3,874.8	2.1	-4.2	-2.0	0.86	-0.32	-35.56
3,900.0	1.25	253.99	3,899.8	1.9	-4.7	-1.8	0.80	0.00	36.60
3,925.0	1.22	245.47	3,924.8	1.7	-5.2	-1.6	0.74	-0.12	-34.08
3,950.0	0.64	241.02	3,949.8	1.5	-5.6	-1.4	2.34	-2.32	-17.80
3,975.0	0.07	151.31	3,974.8	1.5	-5.7	-1.3	2.57	-2.28	-358.84
4,000.0	0.26	78.04	3,999.8	1.5	-5.6	-1.3	1.00	0.76	-293.08
4,025.0	0.36	57.41	4,024.8	1.5	-5.5	-1.4	0.59	0.40	-82.52
4,050.0	0.23	36.04	4,049.8	1.6	-5.4	-1.5	0.67	-0.52	-85.48
4,075.0	0.19	70.91	4,074.8	1.7	-5.4	-1.5	0.53	-0.16	139.48
4,100.0	0.35	47.50	4,099.8	1.7	-5.3	-1.6	0.76	0.64	-93.64
4,125.0	0.23	32.33	4,124.8	1.8	-5.2	-1.7	0.57	-0.48	-60.68
4,150.0	0.55	71.66	4,149.8	1.9	-5.0	-1.8	1.60	1.28	157.32
4,175.0	0.93	62.86	4,174.8	2.0	-4.7	-1.9	1.58	1.52	-35.20
4,200.0	0.74	53.76	4,199.8	2.2	-4.4	-2.1	0.92	-0.76	-36.40
4,225.0	0.96	65.66	4,224.8	2.4	-4.1	-2.3	1.12	0.88	47.60
4,250.0	0.86	55.04	4,249.8	2.6	-3.8	-2.5	0.78	-0.40	-42.48
4,275.0	0.92	66.60	4,274.8	2.8	-3.4	-2.7	0.76	0.24	46.24
4,300.0	0.88	63.60	4,299.8	2.9	-3.1	-2.9	0.25	-0.16	-12.00
4,325.0	0.68	94.14	4,324.8	3.0	-2.7	-3.0	1.82	-0.80	122.16
4,350.0	0.82	125.52	4,349.8	2.9	-2.5	-2.8	1.71	0.56	125.52
4,375.0	1.11	133.21	4,374.8	2.6	-2.1	-2.6	1.27	1.16	30.76
4,400.0	1.43	123.02	4,399.8	2.3	-1.7	-2.3	1.56	1.28	-40.76
4,425.0	1.58	125.56	4,424.7	1.9	-1.2	-1.9	0.66	0.60	10.16
4,450.0	1.79	120.88	4,449.7	1.5	-0.5	-1.5	1.00	0.84	-18.72
4,475.0	1.82	119.05	4,474.7	1.1	0.1	-1.1	0.26	0.12	-7.32
4,500.0	1.65	117.20	4,499.7	0.8	0.8	-0.8	0.72	-0.68	-7.40
4,525.0	1.00	130.22	4,524.7	0.5	1.3	-0.5	2.85	-2.60	52.08
4,550.0	0.42	196.23	4,549.7	0.2	1.4	-0.3	3.65	-2.32	264.04
4,575.0	0.64	237.77	4,574.7	0.1	1.3	-0.1	1.71	0.88	166.16
4,600.0	0.52	259.39	4,599.7	0.0	1.1	0.0	0.99	-0.48	86.48
4,625.0	0.60	251.37	4,624.7	-0.1	0.8	0.1	0.45	0.32	-32.08

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: BULLDOG
Well: HENNIN FED #24H
Wellbore: OWB
Design: ACTUAL WELLPATH

Local Co-ordinate Reference: Well HENNIN FED #24H
TVD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
MD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,650.0	0.07	128.04	4,649.7	-0.1	0.7	0.1	2.56	-2.12	-493.32
4,675.0	0.22	103.14	4,674.7	-0.2	0.8	0.1	0.64	0.60	-99.60
4,700.0	0.62	99.41	4,699.7	-0.2	1.0	0.2	1.60	1.60	-14.92
4,725.0	1.16	92.28	4,724.7	-0.2	1.3	0.2	2.20	2.16	-28.52
4,750.0	1.18	94.61	4,749.7	-0.3	1.9	0.2	0.21	0.08	9.32
4,775.0	1.38	92.71	4,774.7	-0.3	2.4	0.2	0.82	0.80	-7.60
4,800.0	0.96	82.42	4,799.7	-0.3	2.9	0.2	1.87	-1.68	-41.16
4,825.0	0.89	87.80	4,824.7	-0.2	3.3	0.2	0.45	-0.28	21.52
4,850.0	0.84	92.74	4,849.7	-0.2	3.7	0.2	0.36	-0.20	19.76
4,875.0	0.79	91.79	4,874.7	-0.3	4.1	0.2	0.21	-0.20	-3.80
4,900.0	0.22	61.83	4,899.7	-0.2	4.3	0.1	2.44	-2.28	-119.84
4,925.0	0.22	320.86	4,924.7	-0.2	4.3	0.1	1.36	0.00	-403.88
4,950.0	0.30	309.63	4,949.7	-0.1	4.2	0.0	0.38	0.32	-44.92
4,975.0	0.35	334.94	4,974.7	0.0	4.1	-0.1	0.60	0.20	101.24
5,000.0	0.44	325.38	4,999.7	0.2	4.0	-0.2	0.45	0.36	-38.24
5,025.0	0.41	302.00	5,024.7	0.3	3.9	-0.4	0.70	-0.12	-93.52
5,050.0	0.31	300.33	5,049.7	0.4	3.8	-0.4	0.40	-0.40	-6.68
5,075.0	0.39	331.37	5,074.7	0.5	3.7	-0.6	0.81	0.32	124.16
5,100.0	0.55	315.51	5,099.7	0.6	3.5	-0.7	0.82	0.64	-63.44
5,125.0	0.57	307.35	5,124.7	0.8	3.4	-0.9	0.33	0.08	-32.64
5,150.0	0.39	312.64	5,149.7	0.9	3.2	-1.0	0.74	-0.72	21.16
5,175.0	0.63	330.32	5,174.7	1.1	3.1	-1.2	1.14	0.96	70.72
5,200.0	0.66	314.02	5,199.7	1.3	2.9	-1.4	0.74	0.12	-65.20
5,225.0	0.58	306.65	5,224.7	1.5	2.7	-1.6	0.45	-0.32	-29.48
5,250.0	0.49	319.24	5,249.7	1.7	2.5	-1.7	0.59	-0.36	50.36
5,275.0	0.68	321.29	5,274.7	1.9	2.4	-1.9	0.76	0.76	8.20
5,300.0	0.67	307.97	5,299.7	2.1	2.1	-2.1	0.63	-0.04	-53.28
5,325.0	0.48	310.35	5,324.7	2.2	2.0	-2.3	0.77	-0.76	9.52
5,350.0	0.62	322.01	5,349.7	2.4	1.8	-2.4	0.71	0.56	46.64
5,375.0	0.65	309.51	5,374.7	2.6	1.6	-2.6	0.57	0.12	-50.00
5,400.0	0.59	302.23	5,399.6	2.8	1.4	-2.8	0.40	-0.24	-29.12
5,425.0	0.52	321.48	5,424.6	2.9	1.2	-2.9	0.79	-0.28	77.00
5,450.0	0.73	313.82	5,449.6	3.1	1.0	-3.1	0.90	0.84	-30.64
5,475.0	0.61	301.90	5,474.6	3.3	0.8	-3.3	0.73	-0.48	-47.68
5,500.0	0.50	324.22	5,499.6	3.4	0.6	-3.5	0.96	-0.44	89.28
5,525.0	0.71	313.05	5,524.6	3.6	0.4	-3.7	0.96	0.84	-44.68
5,550.0	0.59	305.02	5,549.6	3.8	0.2	-3.8	0.60	-0.48	-32.12
5,575.0	0.68	319.39	5,574.6	4.0	0.0	-4.0	0.73	0.36	57.48
5,600.0	0.67	307.85	5,599.6	4.2	-0.2	-4.2	0.54	-0.04	-46.16
5,625.0	0.56	320.44	5,624.6	4.4	-0.4	-4.4	0.69	-0.44	50.36
5,650.0	0.80	309.85	5,649.6	4.6	-0.6	-4.6	1.08	0.96	-42.36
5,675.0	0.61	306.49	5,674.6	4.8	-0.8	-4.8	0.78	-0.76	-13.44
5,700.0	0.51	326.57	5,699.6	5.0	-1.0	-4.9	0.87	-0.40	80.32

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: BULLDOG
Well: HENNIN FED #24H
Wellbore: OWB
Design: ACTUAL WELLPATH

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well HENNIN FED #24H
 RKB=3170.7+30 @ 3200.7usft (NABORS 894)
 RKB=3170.7+30 @ 3200.7usft (NABORS 894)
 Grid
 Minimum Curvature
 EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,725.0	0.71	312.34	5,724.6	5.2	-1.2	-5.1	1.00	0.80	-56.92
5,750.0	0.60	307.77	5,749.6	5.3	-1.4	-5.3	0.49	-0.44	-18.28
5,775.0	0.62	327.70	5,774.6	5.5	-1.6	-5.5	0.85	0.08	79.72
5,800.0	0.58	312.89	5,799.6	5.7	-1.7	-5.7	0.64	-0.16	-59.24
5,825.0	0.59	331.50	5,824.6	5.9	-1.9	-5.9	0.76	0.04	74.44
5,850.0	0.49	316.45	5,849.6	6.1	-2.0	-6.1	0.69	-0.40	-60.20
5,875.0	0.52	320.35	5,874.6	6.3	-2.2	-6.2	0.18	0.12	15.60
5,900.0	0.62	319.78	5,899.6	6.5	-2.3	-6.4	0.40	0.40	-2.28
5,925.0	0.54	320.12	5,924.6	6.7	-2.5	-6.6	0.32	-0.32	1.36
5,950.0	0.40	325.51	5,949.6	6.8	-2.6	-6.8	0.59	-0.56	21.56
5,975.0	0.38	333.03	5,974.6	7.0	-2.7	-6.9	0.22	-0.08	30.08
6,000.0	0.39	321.03	5,999.6	7.1	-2.8	-7.1	0.32	0.04	-48.00
6,025.0	0.52	318.20	6,024.6	7.3	-2.9	-7.2	0.53	0.52	-11.32
6,050.0	0.37	324.99	6,049.6	7.4	-3.1	-7.4	0.63	-0.60	27.16
6,075.0	0.45	320.36	6,074.6	7.6	-3.2	-7.5	0.35	0.32	-18.52
6,100.0	0.42	322.42	6,099.6	7.7	-3.3	-7.6	0.14	-0.12	8.24
6,125.0	0.36	332.91	6,124.6	7.9	-3.4	-7.8	0.37	-0.24	41.96
6,150.0	0.55	347.87	6,149.6	8.0	-3.4	-8.0	0.89	0.76	59.84
6,175.0	0.61	332.77	6,174.6	8.3	-3.5	-8.2	0.65	0.24	-60.40
6,200.0	0.53	330.95	6,199.6	8.5	-3.6	-8.4	0.33	-0.32	-7.28
6,225.0	0.36	330.68	6,224.6	8.7	-3.7	-8.6	0.68	-0.68	-1.08
6,250.0	0.35	337.22	6,249.6	8.8	-3.8	-8.7	0.17	-0.04	26.16
6,275.0	0.40	357.50	6,274.6	9.0	-3.8	-8.9	0.56	0.20	81.12
6,300.0	0.57	342.08	6,299.6	9.2	-3.9	-9.1	0.85	0.68	-61.68
6,325.0	0.52	334.33	6,324.6	9.4	-4.0	-9.3	0.36	-0.20	-31.00
6,350.0	0.39	330.97	6,349.6	9.6	-4.1	-9.5	0.53	-0.52	-13.44
6,375.0	0.41	1.10	6,374.6	9.7	-4.1	-9.6	0.84	0.08	120.52
6,400.0	0.62	345.04	6,399.6	10.0	-4.1	-9.9	1.01	0.84	-64.24
6,425.0	0.45	335.57	6,424.6	10.2	-4.2	-10.1	0.76	-0.68	-37.88
6,450.0	0.31	352.65	6,449.6	10.3	-4.3	-10.2	0.71	-0.56	68.32
6,475.0	0.58	348.41	6,474.6	10.5	-4.3	-10.4	1.09	1.08	-16.96
6,500.0	0.50	336.27	6,499.6	10.7	-4.4	-10.7	0.56	-0.32	-48.56
6,525.0	0.45	359.24	6,524.6	10.9	-4.4	-10.9	0.78	-0.20	91.88
6,550.0	0.58	342.34	6,549.6	11.2	-4.4	-11.1	0.79	0.52	-67.60
6,575.0	0.46	335.80	6,574.6	11.4	-4.5	-11.3	0.53	-0.48	-26.16
6,600.0	0.71	347.42	6,599.6	11.6	-4.6	-11.5	1.10	1.00	46.48
6,625.0	0.89	330.96	6,624.6	11.9	-4.7	-11.8	1.16	0.72	-65.84
6,650.0	0.85	324.58	6,649.6	12.3	-4.9	-12.2	0.42	-0.16	-25.52
6,675.0	0.89	339.25	6,674.6	12.6	-5.1	-12.5	0.90	0.16	58.68
6,700.0	0.95	328.93	6,699.6	13.0	-5.3	-12.8	0.70	0.24	-41.28
6,725.0	0.79	324.39	6,724.6	13.3	-5.5	-13.2	0.70	-0.64	-18.16
6,750.0	0.82	325.85	6,749.6	13.6	-5.7	-13.4	0.15	0.12	5.84
6,775.0	0.84	322.66	6,774.6	13.9	-5.9	-13.7	0.20	0.08	-12.76
6,800.0	0.79	325.78	6,799.6	14.1	-6.1	-14.0	0.27	-0.20	12.48

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: BULLDOG
Well: HENNIN FED #24H
Wellbore: OWB
Design: ACTUAL WELLPATH

Local Co-ordinate Reference: Well HENNIN FED #24H
TVD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
MD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,825.0	0.95	335.69	6,824.6	14.5	-6.3	-14.3	0.88	0.64	39.64
6,850.0	1.00	325.62	6,849.6	14.8	-6.5	-14.7	0.71	0.20	-40.28
6,875.0	1.00	315.40	6,874.6	15.2	-6.8	-15.0	0.71	0.00	-40.88
6,900.0	1.38	307.98	6,899.6	15.5	-7.2	-15.4	1.64	1.52	-29.68
6,925.0	1.64	308.41	6,924.6	15.9	-7.7	-15.8	1.04	1.04	1.72
6,950.0	1.60	303.87	6,949.5	16.3	-8.3	-16.2	0.54	-0.16	-18.16
6,975.0	1.47	302.21	6,974.5	16.7	-8.8	-16.5	0.55	-0.52	-6.64
7,000.0	1.61	305.94	6,999.5	17.1	-9.4	-16.9	0.69	0.56	14.92
7,025.0	1.56	302.87	7,024.5	17.5	-9.9	-17.3	0.39	-0.20	-12.28
7,050.0	1.48	301.58	7,049.5	17.8	-10.5	-17.6	0.35	-0.32	-5.16
7,075.0	1.37	301.52	7,074.5	18.2	-11.0	-17.9	0.44	-0.44	-0.24
7,100.0	1.36	306.85	7,099.5	18.5	-11.5	-18.2	0.51	-0.04	21.32
7,125.0	1.53	306.96	7,124.5	18.9	-12.0	-18.6	0.68	0.68	0.44
7,150.0	1.39	300.78	7,149.5	19.2	-12.6	-19.0	0.84	-0.56	-24.72
7,175.0	1.34	300.86	7,174.5	19.5	-13.1	-19.2	0.20	-0.20	0.32
7,200.0	1.19	298.16	7,199.5	19.8	-13.5	-19.5	0.65	-0.60	-10.80
7,225.0	1.18	299.88	7,224.5	20.1	-14.0	-19.8	0.15	-0.04	6.88
7,250.0	1.21	299.38	7,249.5	20.3	-14.5	-20.0	0.13	0.12	-2.00
7,275.0	1.15	301.33	7,274.4	20.6	-14.9	-20.2	0.29	-0.24	7.80
7,300.0	1.24	301.50	7,299.4	20.8	-15.3	-20.5	0.36	0.36	0.68
7,325.0	1.25	297.95	7,324.4	21.1	-15.8	-20.8	0.31	0.04	-14.20
7,350.0	1.15	297.50	7,349.4	21.4	-16.3	-21.0	0.40	-0.40	-1.80
7,375.0	1.03	292.99	7,374.4	21.6	-16.7	-21.2	0.59	-0.48	-18.04
7,400.0	0.91	297.41	7,399.4	21.7	-17.1	-21.4	0.57	-0.48	17.68
7,425.0	1.04	293.89	7,424.4	21.9	-17.5	-21.5	0.57	0.52	-14.08
7,450.0	0.98	287.88	7,449.4	22.1	-17.9	-21.7	0.49	-0.24	-24.04
7,475.0	0.97	284.72	7,474.4	22.2	-18.3	-21.8	0.22	-0.04	-12.64
7,500.0	0.82	291.74	7,499.4	22.3	-18.7	-21.9	0.74	-0.60	28.08
7,525.0	0.94	290.93	7,524.4	22.5	-19.0	-22.0	0.48	0.48	-3.24
7,550.0	0.94	283.32	7,549.4	22.6	-19.4	-22.2	0.50	0.00	-30.44
7,575.0	0.82	287.62	7,574.4	22.7	-19.8	-22.3	0.55	-0.48	17.20
7,600.0	1.06	289.73	7,599.4	22.8	-20.2	-22.4	0.97	0.96	8.44
7,625.0	0.96	282.23	7,624.4	22.9	-20.6	-22.5	0.66	-0.40	-30.00
7,650.0	0.85	293.83	7,649.4	23.1	-21.0	-22.6	0.85	-0.44	46.40
7,675.0	0.91	283.12	7,674.4	23.2	-21.3	-22.7	0.70	0.24	-42.84
7,700.0	0.93	288.87	7,699.4	23.3	-21.7	-22.8	0.38	0.08	23.00
7,725.0	0.99	285.52	7,724.4	23.4	-22.1	-22.9	0.33	0.24	-13.40
7,750.0	1.39	288.46	7,749.4	23.6	-22.6	-23.1	1.62	1.60	11.76
7,775.0	1.31	283.31	7,774.4	23.7	-23.2	-23.2	0.58	-0.32	-20.60
7,800.0	1.47	284.34	7,799.4	23.9	-23.8	-23.4	0.65	0.64	4.12
7,825.0	1.43	283.13	7,824.3	24.0	-24.4	-23.5	0.20	-0.16	-4.84
7,850.0	1.37	288.90	7,849.3	24.2	-25.0	-23.7	0.61	-0.24	23.08
7,875.0	1.49	283.74	7,874.3	24.4	-25.6	-23.8	0.70	0.48	-20.64

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: BULLDOG
Well: HENNIN FED #24H
Wellbore: OWB
Design: ACTUAL WELLPATH

Local Co-ordinate Reference: Well HENNIN FED #24H
TVD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
MD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,900.0	1.41	289.48	7,899.3	24.5	-26.2	-24.0	0.66	-0.32	22.96	
7,925.0	2.05	289.68	7,924.3	24.8	-26.9	-24.2	2.56	2.56	0.80	
7,950.0	2.10	295.05	7,949.3	25.1	-27.7	-24.5	0.80	0.20	21.48	
7,975.0	2.27	295.06	7,974.3	25.5	-28.6	-24.9	0.68	0.68	0.04	
8,000.0	2.25	292.97	7,999.3	25.9	-29.5	-25.3	0.34	-0.08	-8.36	
8,025.0	2.29	293.03	8,024.2	26.3	-30.4	-25.7	0.16	0.16	0.24	
8,050.0	2.05	292.91	8,049.2	26.7	-31.3	-26.0	0.96	-0.96	-0.48	
8,075.0	2.20	294.52	8,074.2	27.1	-32.1	-26.4	0.65	0.60	6.44	
8,100.0	2.06	291.93	8,099.2	27.4	-33.0	-26.7	0.68	-0.56	-10.36	
8,125.0	2.00	294.27	8,124.2	27.8	-33.8	-27.1	0.41	-0.24	9.36	
8,150.0	2.10	292.46	8,149.2	28.1	-34.6	-27.4	0.48	0.40	-7.24	
8,175.0	1.94	290.97	8,174.1	28.5	-35.4	-27.7	0.67	-0.64	-5.96	
8,200.0	2.32	297.43	8,199.1	28.8	-36.3	-28.1	1.80	1.52	25.84	
8,225.0	2.47	299.64	8,224.1	29.3	-37.2	-28.6	0.70	0.60	8.84	
8,250.0	2.37	301.21	8,249.1	29.9	-38.1	-29.1	0.48	-0.40	6.28	
8,275.0	2.63	302.84	8,274.1	30.5	-39.0	-29.6	1.08	1.04	6.52	
8,300.0	2.50	303.16	8,299.0	31.1	-40.0	-30.2	0.52	-0.52	1.28	
8,325.0	2.34	307.80	8,324.0	31.7	-40.8	-30.8	1.01	-0.64	18.56	
8,350.0	2.52	308.20	8,349.0	32.3	-41.6	-31.4	0.72	0.72	1.60	
8,375.0	2.46	307.21	8,374.0	33.0	-42.5	-32.1	0.30	-0.24	-3.96	
8,400.0	2.38	313.71	8,398.9	33.7	-43.3	-32.8	1.14	-0.32	26.00	
8,425.0	2.54	310.91	8,423.9	34.4	-44.1	-33.5	0.80	0.64	-11.20	
8,450.0	2.58	310.84	8,448.9	35.1	-44.9	-34.2	0.16	0.16	-0.28	
8,475.0	2.55	312.38	8,473.9	35.9	-45.8	-34.9	0.30	-0.12	6.16	
8,500.0	2.42	311.94	8,498.8	36.6	-46.6	-35.6	0.53	-0.52	-1.76	
8,525.0	2.30	313.23	8,523.8	37.3	-47.3	-36.3	0.52	-0.48	5.16	
8,550.0	2.19	311.77	8,548.8	38.0	-48.1	-36.9	0.50	-0.44	-5.84	
8,575.0	2.06	314.50	8,573.8	38.6	-48.7	-37.6	0.66	-0.52	10.92	
8,600.0	2.15	318.89	8,598.8	39.3	-49.4	-38.2	0.74	0.36	17.56	
8,625.0	1.94	315.86	8,623.8	39.9	-50.0	-38.9	0.94	-0.84	-12.12	
8,650.0	1.71	320.40	8,648.7	40.5	-50.5	-39.4	1.09	-0.92	18.16	
8,675.0	1.90	320.04	8,673.7	41.1	-51.0	-40.0	0.76	0.76	-1.44	
8,700.0	1.71	318.68	8,698.7	41.7	-51.5	-40.6	0.78	-0.76	-5.44	
8,725.0	1.67	326.23	8,723.7	42.3	-52.0	-41.2	0.90	-0.16	30.20	
8,750.0	1.75	319.18	8,748.7	42.9	-52.4	-41.8	0.90	0.32	-28.20	
8,775.0	1.61	321.40	8,773.7	43.5	-52.9	-42.3	0.62	-0.56	8.88	
8,800.0	1.91	326.23	8,798.7	44.1	-53.3	-42.9	1.34	1.20	19.32	
8,825.0	1.76	325.32	8,823.7	44.7	-53.8	-43.6	0.61	-0.60	-3.64	
8,850.0	1.86	324.95	8,848.6	45.4	-54.2	-44.2	0.40	0.40	-1.48	
8,875.0	2.10	331.26	8,873.6	46.1	-54.7	-45.0	1.30	0.96	25.24	
8,900.0	1.99	335.58	8,898.6	46.9	-55.1	-45.7	0.76	-0.44	17.28	
8,925.0	2.17	334.92	8,923.6	47.7	-55.5	-46.6	0.73	0.72	-2.64	
8,950.0	2.18	337.67	8,948.6	48.6	-55.9	-47.4	0.42	0.04	11.00	

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: BULLDOG
Well: HENNIN FED #24H
Wellbore: OWB
Design: ACTUAL WELLPATH

Local Co-ordinate Reference: Well HENNIN FED #24H
TVD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
MD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,975.0	2.02	340.62	8,973.6	49.5	-56.2	-48.3	0.77	-0.64	11.80	
9,000.0	2.17	334.35	8,998.5	50.3	-56.5	-49.1	1.09	0.60	-25.08	
9,025.0	2.05	335.59	9,023.5	51.1	-56.9	-49.9	0.51	-0.48	4.96	
9,050.0	2.09	336.26	9,048.5	52.0	-57.3	-50.7	0.19	0.16	2.68	
9,075.0	2.01	337.24	9,073.5	52.8	-57.7	-51.6	0.35	-0.32	3.92	
9,100.0	1.93	339.47	9,098.5	53.6	-58.0	-52.3	0.44	-0.32	8.92	
9,125.0	1.86	341.11	9,123.5	54.4	-58.2	-53.1	0.35	-0.28	6.56	
9,150.0	1.96	342.09	9,148.5	55.2	-58.5	-53.9	0.42	0.40	3.92	
9,175.0	1.87	344.05	9,173.4	56.0	-58.8	-54.7	0.45	-0.36	7.84	
9,200.0	1.87	343.54	9,198.4	56.7	-59.0	-55.5	0.07	0.00	-2.04	
9,225.0	1.83	344.83	9,223.4	57.5	-59.2	-56.2	0.23	-0.16	5.16	
9,250.0	1.78	346.95	9,248.4	58.3	-59.4	-57.0	0.33	-0.20	8.48	
9,275.0	2.02	345.07	9,273.4	59.1	-59.6	-57.8	0.99	0.96	-7.52	
9,300.0	2.06	346.22	9,298.4	59.9	-59.8	-58.7	0.23	0.16	4.60	
9,325.0	1.92	347.27	9,323.4	60.8	-60.0	-59.5	0.58	-0.56	4.20	
9,350.0	2.07	353.32	9,348.3	61.6	-60.2	-60.4	1.03	0.60	24.20	
9,375.0	2.04	349.20	9,373.3	62.5	-60.3	-61.2	0.60	-0.12	-16.48	
9,400.0	2.01	348.86	9,398.3	63.4	-60.5	-62.1	0.13	-0.12	-1.36	
9,425.0	2.10	348.90	9,423.3	64.3	-60.6	-63.0	0.36	0.36	0.16	
9,450.0	2.09	354.70	9,448.3	65.2	-60.8	-63.9	0.85	-0.04	23.20	
9,475.0	1.87	358.46	9,473.3	66.0	-60.8	-64.7	1.02	-0.88	15.04	
9,500.0	1.86	356.70	9,498.2	66.9	-60.9	-65.6	0.23	-0.04	-7.04	
9,525.0	1.78	0.09	9,523.2	67.6	-60.9	-66.3	0.54	-0.32	13.56	
9,550.0	1.88	0.47	9,548.2	68.4	-60.9	-67.1	0.40	0.40	1.52	
9,575.0	1.87	7.62	9,573.2	69.3	-60.8	-68.0	0.94	-0.04	28.60	
9,600.0	1.82	6.74	9,598.2	70.1	-60.7	-68.8	0.23	-0.20	-3.52	
9,625.0	2.19	6.68	9,623.2	70.9	-60.6	-69.6	1.48	1.48	-0.24	
9,650.0	2.38	7.54	9,648.2	71.9	-60.5	-70.6	0.77	0.76	3.44	
9,675.0	2.36	10.09	9,673.1	72.9	-60.3	-71.6	0.43	-0.08	10.20	
9,700.0	2.47	8.24	9,698.1	74.0	-60.2	-72.7	0.54	0.44	-7.40	
9,725.0	2.20	359.96	9,723.1	75.0	-60.1	-73.7	1.73	-1.08	-33.12	
9,750.0	2.45	0.01	9,748.1	76.0	-60.1	-74.7	1.00	1.00	0.20	
9,775.0	2.43	357.02	9,773.1	77.1	-60.1	-75.8	0.52	-0.08	-11.96	
9,800.0	2.24	345.20	9,798.0	78.1	-60.3	-76.8	2.07	-0.76	-47.28	
9,825.0	2.48	322.74	9,823.0	79.0	-60.7	-77.7	3.79	0.96	-89.84	
9,850.0	2.73	315.99	9,848.0	79.8	-61.5	-78.5	1.58	1.00	-27.00	
9,875.0	2.73	316.17	9,873.0	80.7	-62.3	-79.4	0.03	0.00	0.72	
9,900.0	2.55	315.69	9,897.9	81.5	-63.1	-80.2	0.73	-0.72	-1.92	
9,925.0	2.58	315.25	9,922.9	82.3	-63.9	-80.9	0.14	0.12	-1.76	
9,950.0	2.54	318.35	9,947.9	83.1	-64.6	-81.7	0.58	-0.16	12.40	
9,975.0	2.50	319.00	9,972.9	84.0	-65.4	-82.6	0.20	-0.16	2.60	
10,000.0	2.62	320.36	9,997.8	84.8	-66.1	-83.4	0.54	0.48	5.44	
10,025.0	2.22	319.80	10,022.8	85.6	-66.8	-84.2	1.60	-1.60	-2.24	
10,050.0	2.41	317.11	10,047.8	86.4	-67.4	-84.9	0.88	0.76	-10.76	

Company: NORTHERN DELAWARE BASIN
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,075.0	2.50	314.77	10,072.8	87.1	-68.2	-85.7	0.54	0.36	-9.36
10,100.0	2.71	308.75	10,097.7	87.9	-69.0	-86.4	1.38	0.84	-24.08
10,125.0	2.74	307.72	10,122.7	88.6	-70.0	-87.1	0.23	0.12	-4.12
10,150.0	2.63	306.13	10,147.7	89.3	-70.9	-87.8	0.53	-0.44	-6.36
10,175.0	2.38	309.33	10,172.7	90.0	-71.8	-88.5	1.15	-1.00	12.80
10,200.0	2.15	312.96	10,197.6	90.6	-72.5	-89.1	1.08	-0.92	14.52
10,225.0	2.04	316.96	10,222.6	91.3	-73.1	-89.7	0.73	-0.44	16.00
10,250.0	1.94	328.12	10,247.6	92.0	-73.7	-90.4	1.60	-0.40	44.64
10,275.0	2.05	328.04	10,272.6	92.7	-74.1	-91.1	0.44	0.44	-0.32
10,300.0	1.89	326.14	10,297.6	93.4	-74.6	-91.8	0.69	-0.64	-7.60
10,325.0	1.74	331.03	10,322.6	94.1	-75.0	-92.5	0.86	-0.60	19.56
10,350.0	1.98	329.65	10,347.6	94.8	-75.4	-93.2	0.98	0.96	-5.52
10,375.0	2.16	316.61	10,372.5	95.5	-76.0	-93.9	2.01	0.72	-52.16
10,400.0	2.35	307.84	10,397.5	96.2	-76.7	-94.5	1.57	0.76	-35.08
10,425.0	2.38	310.29	10,422.5	96.8	-77.5	-95.2	0.42	0.12	9.80
10,450.0	2.58	308.30	10,447.5	97.5	-78.3	-95.8	0.87	0.80	-7.96
10,475.0	2.44	309.65	10,472.5	98.2	-79.2	-96.5	0.61	-0.56	5.40
10,500.0	2.12	312.88	10,497.4	98.9	-79.9	-97.2	1.38	-1.28	12.92
10,525.0	2.08	319.23	10,522.4	99.5	-80.6	-97.8	0.94	-0.16	25.40
10,550.0	2.18	316.85	10,547.4	100.2	-81.2	-98.5	0.53	0.40	-9.52
10,575.0	2.04	315.92	10,572.4	100.9	-81.8	-99.1	0.58	-0.56	-3.72
10,600.0	2.13	320.81	10,597.4	101.6	-82.4	-99.8	0.80	0.36	19.56
10,625.0	2.21	318.84	10,622.3	102.3	-83.0	-100.5	0.44	0.32	-7.88
10,650.0	2.00	316.90	10,647.3	103.0	-83.6	-101.2	0.89	-0.84	-7.76
10,675.0	1.91	323.35	10,672.3	103.6	-84.2	-101.8	0.95	-0.36	25.80
10,700.0	2.16	321.77	10,697.3	104.3	-84.7	-102.5	1.02	1.00	-6.32
10,725.0	1.96	322.78	10,722.3	105.0	-85.3	-103.2	0.81	-0.80	4.04
10,750.0	1.95	332.42	10,747.3	105.7	-85.7	-103.9	1.31	-0.04	38.56
10,775.0	2.02	336.75	10,772.3	106.5	-86.1	-104.7	0.66	0.28	17.32
10,800.0	1.96	341.71	10,797.2	107.3	-86.4	-105.5	0.73	-0.24	19.84
10,825.0	2.16	346.81	10,822.2	108.2	-86.7	-106.3	1.08	0.80	20.40
10,850.0	2.14	338.87	10,847.2	109.1	-86.9	-107.2	1.19	-0.08	-31.76
10,875.0	2.03	333.83	10,872.2	109.9	-87.3	-108.1	0.85	-0.44	-20.16
10,900.0	2.23	328.95	10,897.2	110.7	-87.7	-108.9	1.08	0.80	-19.52
10,925.0	2.16	325.62	10,922.2	111.6	-88.3	-109.7	0.58	-0.28	-13.32
10,950.0	2.63	329.76	10,947.1	112.4	-88.8	-110.5	2.00	1.88	16.56
10,975.0	3.29	328.09	10,972.1	113.5	-89.5	-111.6	2.66	2.64	-6.68
11,000.0	3.29	323.91	10,997.1	114.7	-90.3	-112.8	0.96	0.00	-16.72
11,025.0	3.37	330.34	11,022.0	115.9	-91.1	-114.0	1.53	0.32	25.72
11,050.0	3.25	328.66	11,047.0	117.2	-91.8	-115.2	0.62	-0.48	-6.72
11,075.0	3.31	331.94	11,071.9	118.4	-92.5	-116.5	0.79	0.24	13.12
11,100.0	3.41	331.99	11,096.9	119.7	-93.2	-117.7	0.40	0.40	0.20
11,125.0	3.23	340.93	11,121.8	121.0	-93.8	-119.0	2.19	-0.72	35.76

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
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Wellbore: OWB
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Local Co-ordinate Reference: Well HENNIN FED #24H
TVD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
MD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,150.0	2.56	341.28	11,146.8	122.2	-94.2	-120.2	2.68	-2.68	1.40
11,175.0	2.64	337.96	11,171.8	123.3	-94.6	-121.3	0.68	0.32	-13.28
11,200.0	2.87	325.06	11,196.8	124.4	-95.2	-122.3	2.64	0.92	-51.60
11,225.0	3.21	316.93	11,221.7	125.4	-96.0	-123.3	2.19	1.36	-32.52
11,250.0	3.55	313.44	11,246.7	126.4	-97.0	-124.3	1.59	1.36	-13.96
11,275.0	3.99	312.32	11,271.6	127.5	-98.2	-125.4	1.78	1.76	-4.48
11,300.0	4.43	313.14	11,296.6	128.8	-99.6	-126.7	1.78	1.76	3.28
11,325.0	4.52	314.31	11,321.5	130.1	-101.0	-128.0	0.51	0.36	4.68
11,350.0	4.66	315.28	11,346.4	131.5	-102.4	-129.3	0.64	0.56	3.88
11,375.0	4.81	315.87	11,371.3	133.0	-103.9	-130.8	0.63	0.60	2.36
11,400.0	4.88	314.94	11,396.2	134.5	-105.3	-132.3	0.42	0.28	-3.72
11,425.0	4.32	312.18	11,421.1	135.9	-106.8	-133.6	2.41	-2.24	-11.04
11,450.0	4.04	308.63	11,446.1	137.1	-108.2	-134.8	1.52	-1.12	-14.20
11,475.0	3.84	305.07	11,471.0	138.1	-109.6	-135.8	1.26	-0.80	-14.24
11,500.0	3.50	301.40	11,496.0	139.0	-110.9	-136.6	1.65	-1.36	-14.68
11,525.0	2.87	294.10	11,520.9	139.6	-112.1	-137.2	2.99	-2.52	-29.20
11,550.0	2.61	290.66	11,545.9	140.1	-113.2	-137.7	1.23	-1.04	-13.76
11,575.0	2.52	290.76	11,570.9	140.5	-114.3	-138.1	0.36	-0.36	0.40
11,600.0	1.94	294.57	11,595.9	140.9	-115.2	-138.4	2.39	-2.32	15.24
11,625.0	1.21	308.88	11,620.9	141.2	-115.8	-138.7	3.29	-2.92	57.24
11,650.0	1.25	314.36	11,645.8	141.6	-116.2	-139.1	0.50	0.16	21.92
11,675.0	1.19	323.19	11,670.8	142.0	-116.5	-139.5	0.79	-0.24	35.32
11,678.0	1.18	324.45	11,673.8	142.0	-116.5	-139.5	0.93	-0.33	42.00
11,883.0	2.34	308.40	11,878.7	146.3	-121.0	-143.7	0.61	0.57	-7.83
11,978.0	2.48	308.38	11,973.7	148.8	-124.2	-146.2	0.15	0.15	-0.02
12,041.0	2.47	303.13	12,036.6	150.4	-126.4	-147.7	0.36	-0.02	-8.33
12,072.0	2.15	293.08	12,067.6	151.0	-127.5	-148.3	1.66	-1.03	-32.42
12,103.0	1.99	251.95	12,098.6	151.1	-128.5	-148.3	4.72	-0.52	-132.68
12,134.0	3.37	216.44	12,129.5	150.2	-129.6	-147.4	6.76	4.45	-114.55
12,166.0	4.51	199.03	12,161.4	148.2	-130.5	-145.4	5.13	3.56	-54.41
12,197.0	5.73	193.08	12,192.3	145.6	-131.3	-142.7	4.29	3.94	-19.19
12,229.0	9.62	182.46	12,224.0	141.3	-131.8	-138.5	12.89	12.16	-33.19
12,261.0	14.75	178.74	12,255.3	134.6	-131.8	-131.8	16.21	16.03	-11.63
12,291.0	20.81	177.38	12,283.9	125.4	-131.5	-122.6	20.25	20.20	-4.53
12,322.0	25.30	176.94	12,312.4	113.3	-130.9	-110.5	14.49	14.48	-1.42
12,353.0	29.11	178.88	12,339.9	99.1	-130.4	-96.4	12.62	12.29	6.26
12,385.0	32.40	179.83	12,367.4	82.8	-130.2	-80.0	10.39	10.28	2.97
12,416.0	34.81	180.05	12,393.2	65.6	-130.2	-62.9	7.78	7.77	0.71
12,448.0	38.82	178.45	12,418.9	46.5	-129.9	-43.7	12.88	12.53	-5.00
12,480.0	44.48	176.33	12,442.8	25.2	-128.9	-22.5	18.23	17.69	-6.63
12,511.0	50.27	176.36	12,463.7	2.5	-127.5	0.2	18.68	18.68	0.10
12,542.0	54.35	177.04	12,482.7	-22.0	-126.1	24.7	13.28	13.16	2.19
12,574.0	57.23	177.92	12,500.7	-48.4	-124.9	51.1	9.28	9.00	2.75

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TVD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
MD Reference: RKB=3170.7+30 @ 3200.7usft (NABORS 894)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
12,605.0	61.07	178.75	12,516.6	-75.0	-124.1	77.7	12.60	12.39	2.68	
12,636.0	64.90	180.41	12,530.7	-102.7	-123.9	105.3	13.24	12.35	5.35	
12,667.0	68.79	180.48	12,542.8	-131.2	-124.2	133.7	12.55	12.55	0.23	
12,699.0	71.61	180.04	12,553.7	-161.3	-124.3	163.8	8.91	8.81	-1.38	
12,730.0	74.12	179.08	12,562.8	-190.9	-124.1	193.5	8.62	8.10	-3.10	
12,761.0	76.98	178.01	12,570.6	-220.9	-123.3	223.4	9.81	9.23	-3.45	
12,792.0	78.95	177.34	12,577.0	-251.2	-122.1	253.7	6.70	6.35	-2.16	
12,822.0	80.97	177.05	12,582.2	-280.7	-120.6	283.2	6.80	6.73	-0.97	
12,853.0	84.35	177.08	12,586.2	-311.4	-119.0	313.8	10.90	10.90	0.10	
12,885.0	87.51	177.06	12,588.5	-343.3	-117.4	345.7	9.88	9.88	-0.06	
12,916.0	89.50	176.95	12,589.3	-374.2	-115.8	376.6	6.43	6.42	-0.35	
13,010.0	90.89	177.26	12,589.0	-468.1	-111.0	470.3	1.52	1.48	0.33	
13,105.0	89.86	176.68	12,588.3	-562.9	-106.0	565.1	1.24	-1.08	-0.61	
13,199.0	89.19	178.68	12,589.1	-656.9	-102.2	658.9	2.24	-0.71	2.13	
13,292.0	88.35	185.05	12,591.1	-749.7	-105.2	751.8	6.91	-0.90	6.85	
13,386.0	86.69	179.23	12,595.2	-843.5	-108.8	845.6	6.43	-1.77	-6.19	
13,479.0	86.58	178.34	12,600.7	-936.4	-106.8	938.4	0.96	-0.12	-0.96	
13,574.0	86.67	178.05	12,606.2	-1,031.1	-103.8	1,033.1	0.32	0.09	-0.31	
13,667.0	87.73	178.14	12,610.8	-1,124.0	-100.7	1,125.9	1.14	1.14	0.10	
13,762.0	87.11	179.55	12,615.1	-1,218.9	-98.8	1,220.7	1.62	-0.65	1.48	
13,856.0	87.47	179.47	12,619.5	-1,312.8	-98.0	1,314.5	0.39	0.38	-0.09	
13,950.0	88.38	179.36	12,622.9	-1,406.7	-97.0	1,408.4	0.98	0.97	-0.12	
14,044.0	89.50	179.38	12,624.7	-1,500.7	-96.0	1,502.4	1.19	1.19	0.02	
14,139.0	89.16	180.49	12,625.8	-1,595.7	-95.9	1,597.3	1.22	-0.36	1.17	
14,233.0	87.65	180.87	12,628.4	-1,689.6	-97.0	1,691.3	1.66	-1.61	0.40	
14,327.0	88.60	180.89	12,631.5	-1,783.5	-98.4	1,785.2	1.01	1.01	0.02	
14,421.0	88.04	180.20	12,634.2	-1,877.5	-99.3	1,879.2	0.95	-0.60	-0.73	
14,514.0	87.31	179.79	12,638.0	-1,970.4	-99.3	1,972.1	0.90	-0.78	-0.44	
14,608.0	87.93	179.91	12,641.9	-2,064.3	-99.1	2,066.0	0.67	0.66	0.13	
14,702.0	88.18	182.99	12,645.1	-2,158.2	-101.5	2,159.9	3.29	0.27	3.28	
14,796.0	88.43	185.46	12,647.9	-2,251.9	-108.4	2,253.7	2.64	0.27	2.63	
14,890.0	87.48	184.16	12,651.2	-2,345.5	-116.3	2,347.5	1.71	-1.01	-1.38	
14,982.0	86.64	181.22	12,655.9	-2,437.3	-120.6	2,439.3	3.32	-0.91	-3.20	
15,076.0	87.59	178.77	12,660.7	-2,531.2	-120.6	2,533.2	2.79	1.01	-2.61	
15,169.0	87.48	177.64	12,664.7	-2,624.1	-117.7	2,626.0	1.22	-0.12	-1.22	
15,263.0	87.79	176.49	12,668.5	-2,717.8	-112.8	2,719.6	1.27	0.33	-1.22	
15,357.0	88.88	176.67	12,671.3	-2,811.6	-107.2	2,813.3	1.18	1.16	0.19	
15,451.0	90.11	179.04	12,672.1	-2,905.6	-103.7	2,907.1	2.84	1.31	2.52	
15,545.0	88.18	177.87	12,673.5	-2,999.5	-101.2	3,001.0	2.40	-2.05	-1.24	
15,640.0	88.43	176.67	12,676.3	-3,094.4	-96.7	3,095.7	1.29	0.26	-1.26	
15,733.0	90.28	178.65	12,677.4	-3,187.3	-92.9	3,188.5	2.91	1.99	2.13	
15,827.0	87.20	176.60	12,679.4	-3,281.1	-89.0	3,282.3	3.94	-3.28	-2.18	
15,920.0	87.82	177.45	12,683.5	-3,373.9	-84.2	3,375.0	1.13	0.67	0.91	
16,014.0	88.04	177.81	12,686.9	-3,467.8	-80.3	3,468.7	0.45	0.23	0.38	

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Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,107.0	88.68	177.88	12,689.5	-3,560.7	-76.8	3,561.5	0.69	0.69	0.08
16,202.0	87.54	177.95	12,692.7	-3,655.6	-73.3	3,656.3	1.20	-1.20	0.07
16,296.0	90.87	181.50	12,694.0	-3,749.5	-72.9	3,750.2	5.18	3.54	3.78
16,391.0	91.96	181.21	12,691.6	-3,844.5	-75.1	3,845.2	1.19	1.15	-0.31
16,485.0	92.61	182.57	12,687.9	-3,938.3	-78.2	3,939.1	1.60	0.69	1.45
16,579.0	90.95	182.34	12,685.0	-4,032.2	-82.2	4,033.0	1.78	-1.77	-0.24
16,674.0	88.74	181.50	12,685.2	-4,127.2	-85.4	4,128.0	2.49	-2.33	-0.88
16,769.0	90.73	183.93	12,685.6	-4,222.0	-89.9	4,223.0	3.31	2.09	2.56
16,864.0	88.49	179.12	12,686.3	-4,317.0	-92.5	4,318.0	5.58	-2.36	-5.06
16,958.0	88.52	175.44	12,688.7	-4,410.8	-88.0	4,411.7	3.91	0.03	-3.91
17,053.0	90.70	177.81	12,689.4	-4,505.6	-82.4	4,506.4	3.39	2.29	2.49
17,148.0	92.24	179.08	12,687.0	-4,600.6	-79.8	4,601.2	2.10	1.62	1.34
17,243.0	90.06	180.16	12,685.1	-4,695.5	-79.2	4,696.2	2.56	-2.29	1.14
17,337.0	87.96	179.92	12,686.7	-4,789.5	-79.3	4,790.1	2.25	-2.23	-0.26
17,373.0	88.80	180.50	12,687.7	-4,825.5	-79.4	4,826.1	2.84	2.33	1.61
17,431.0	88.80	180.50	12,688.9	-4,883.5	-79.9	4,884.1	0.00	0.00	0.00

Checked By: _____ Approved By: _____ Date: _____